TSMC-01-045

January 9, 2002

#3 IDS 4-17-02 Rstake

To: Commissioner of Patents and Trademarks
Washington, D.C. 20231

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Subject:

Serial No. 09/992,458 11/16/01

Wong-Cheng Shih, Wenchi Ting, Tzyh-Cheang Lee, Chih-Hsien Lin, Shyh-Chyi Wong

A METHOD FOR MAKING METAL CAPACITORS WITH LOW LEAKAGE CURRENTS FOR MIXED-SIGNAL DEVICES

Grp. Art Unit: 2812

INFORMATION DISCLOSURE STATEMENT

Enclosed is Form PTO-1449, Information Disclosure Citation In An Application.

The following Patents and/or Publications are submitted to comply with the duty of disclosure under CFR 1.97-1.99 and 37 CFR 1.56. Copies of each document is included herewith.

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on January 22, 2002.

Stephen B. Ackerman, Reg.# 37761

Signature/Date 1/22/02

U.S. Patent 5,4[illegible] to Miyazaki, "Capacitor Used in an Integrated Circuit and Comprising Opposing Electrodes Having Barrier Metal Films in Contact with a Dielectric Film," discloses a metal barrier composed of TiN used in contact with the dielectric film to prevent a spurious oxide film from growing and making the capacitors unreliable.

U.S. Patent 6,207,488 to Hwang et al., "Method for Forming a Tantalum Oxide Capacitor Using Two-Step Rapid Thermal Nitridation," discloses a high-k dielectric composed of Ta2O5 treated by rapid thermal anneal (RTA) in nitrogen to improve the dielectric properties.

U.S. Patent 6,201,276 to Agarwal et al., "Method of Fabricating Semiconductor Devices Utilizing In Situ Passivation of Dielectric Thin Films," discloses a bottom electrode formed from a conductor, such as TiN, Ta, W, Si, and the like, and a thin dielectric layer, such as silicon nitride, silicon oxide, tantalum oxide, deposited directly on the bottom electrode.

U.S.Patent 6,204,203 to Narwankar et al., "Post Deposition Treatment of Dielectric Films for Interface Control," discloses how a polysilicon bottom electrode is formed and the surface is converted to a Si3N4.

U.S. Patent 5,936,831 to Kaja et al., "Thin Film Tantalum Oxide Capacitors and Resulting Product," discloses methods for making thin film capacitors and, in particular, to methods for making thin-film capacitors using tantalum oxide dielectric films.

U.S. Patent 5,923,056 to Lee et al., "Electronic Components with Doped Metal Oxide Dielectric Materials and a Process for Making Electronic Components with Doped Metal Oxide Dielectric Materials," discloses a doped, metal oxide dielectric material and electronic components made with this material.

U.S. Patent 6,207,489 to Nam et al., "Method for Manufacturing Capacitor of Semiconductor Memory Device Having Tantalum Oxide Film," discusses the bottom electrode formed and a pretreatment film such as silicon oxide, silicon nitride formed on the bottom electrode.

U.S. Patent 5,468,687 to Carl et al., "Method of Making TA2O5 Thin Film by Low Temperature Ozone Plasma Annealing (Oxidation)," discloses a method for low temperatuare annealing (oxidation) of high dielectric constant Ta2O5 thin films using an ozone enhanced plasma.

Sincerely,

Stephen B. Ackerman, Reg. #37761